

A Fully Integrated Complementary Metal Oxide Semiconductor (CMOS) Fourier Transform Infrared (FTIR) Spectrometer and Raman Spectrometer

ABSTRACT

5 A Fourier Transform Infrared (FTIR) Spectrometer integrated in a CMOS technology on a Silicon-on-Insulator (SOI) wafer is disclosed. The present invention is fully integrated into a compact, miniaturized, low cost, CMOS fabrication compatible chip. The present invention may be operated in various infrared regions ranging from 1.1 μm to 15 μm or it can cover the full spectrum from 1.1 μm to 15 μm all at once.

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The CMOS-FTIR spectrometer disclosed herein has high spectral resolution, no movable parts, no lenses, is compact, not prone to damage in harsh external conditions and can be fabricated with a standard CMOS technology, allowing the mass production of FTIR spectrometers. The fully integrated CMOS-FTIR spectrometer is suitable for battery
15 operation; any and all functionality can be integrated on a chip with standard CMOS technology. The disclosed invention for the FTIR spectrometer may also be adapted for a CMOS-Raman spectrometer.

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Fig. 6b for publication